

1 **WE CLAIM:**

1 1. A disk drive comprising:

2 (a) a disk comprising a plurality of data tracks, each data track comprising a plurality of
3 data sectors and embedded servo sectors, each embedded servo sector comprising a
4 plurality of product servo bursts written at a radial resolution finer than the radial
5 resolution of the data tracks;

6 (b) an actuator arm;

7 (c) a head attached to a distal end of the actuator arm, wherein the actuator arm is rotated
8 to actuate the head radially over the disk to write data to and read data from the data
9 sectors; and

10 (d) a disk controller for self servo writing the disk by:

11 reading reference servo bursts from the disk, wherein the reference servo bursts
12 are written to the disk using an external servo writer at a radial resolution
13 coarser than the radial resolution of the product servo bursts;

14 processing the reference servo bursts to maintain the head in a substantially
15 circular trajectory with respect to the disk to write a first set of the product
16 servo bursts to the disk; and

17 processing the reference servo bursts to maintain the head in a substantially spiral
18 trajectory with respect to the disk to write a second set of the product servo
19 bursts to the disk.

1 2. The disk drive as recited in claim 1, wherein the reference servo bursts are written to the
2 disk at a radial resolution equal to half the radial resolution of the product servo bursts.

1 3. The disk drive as recited in claim 1, wherein a single product servo burst is written
2 circumferentially to the disk between two reference servo bursts.

- 1 4. The disk drive as recited in claim 1, wherein a plurality of product servo bursts are written
2 circumferentially to the disk between two reference servo bursts.
- 1 5. The disk drive as recited in claim 1, wherein the second set of product servo bursts are
2 written to the disk at an oblique angle relative to the first set of product servo bursts.
- 1 6. The disk drive as recited in claim 1, wherein the disk controller writes the first set of
2 product servo bursts to the disk over a single stroke of the actuator arm.
- 1 7. The disk drive as recited in claim 1, wherein the disk controller writes the second set of
2 product servo bursts to the disk over multiple strokes of the actuator arm.
- 1 8. The disk drive as recited in claim 1, wherein the disk controller erases the reference servo
2 bursts.
- 1 9. The disk drive as recited in claim 1, wherein the disk controller overwrites the reference
2 servo bursts with user data.

- 1 10. A method of servo writing a disk drive, the disk drive comprising a disk, an actuator arm,
2 and a head attached to a distal end of the actuator arm, the method comprising the steps
3 of:
4 (a) using an external servo writer to write a plurality of reference servo bursts to the disk;
5 (b) reading the reference servo bursts from the disk and maintaining the head in a
6 substantially circular trajectory with respect to the disk to write a first set of product
7 servo bursts to the disk; and
8 (c) reading the reference servo bursts from the disk and maintaining the head in a
9 substantially spiral trajectory with respect to the disk to write a second set of product
10 servo bursts to the disk.
- 11 11. The method as recited in claim 10, wherein the reference servo bursts are written to the
12 disk at a radial resolution equal to half the radial resolution of the product servo bursts.
- 1 12. The method as recited in claim 10, wherein a single product servo burst is written
2 circumferentially to the disk between two reference servo bursts.
- 1 13. The method as recited in claim 10, wherein a plurality of product servo bursts are written
2 circumferentially to the disk between two reference servo bursts.
- 1 14. The method as recited in claim 10, wherein the second set of product servo bursts are
2 written to the disk at an oblique angle relative to the first set of product servo bursts.
- 1 15. The method as recited in claim 10, wherein the first set of product servo bursts are written
2 to the disk over a single stroke of the actuator arm.
- 1 16. The method as recited in claim 10, wherein the second set of product servo bursts are
2 written to the disk over multiple strokes of the actuator arm.

- 1 17. The method as recited in claim 10, further comprising the step of erasing the reference
2 servo bursts.
- 1 18. The method as recited in claim 10, further comprising the step of overwriting the reference
2 servo bursts with user data.

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- 1 19. A disk drive comprising:
- 2 (a) a disk comprising a plurality of data tracks, each data track comprising a plurality of
- 3 data sectors and embedded servo sectors, each embedded servo sector comprising a
- 4 plurality of product servo bursts written at a radial resolution finer than the radial
- 5 resolution of the data tracks;
- 6 (b) an actuator arm; and
- 7 (c) a head attached to a distal end of the actuator arm, wherein the actuator arm is rotated
- 8 to actuate the head radially over the disk to write data to and read data from the data
- 9 sectors;
- 10 wherein:
- 11 the plurality of product servo bursts in a servo sector comprises a first set of product
- 12 servo bursts and a second set of product servo bursts; and
- 13 the second set of product servo bursts are written to the disk at an oblique angle
- 14 relative to the first set of product servo bursts.
- 15 20. The disk drive as recited in claim 19, wherein:
- 16 (a) the first set of product servo bursts are written to the disk while tracking reference
- 17 servo bursts in a substantially circular trajectory; and
- 18 (b) the second set of product servo bursts are written to the disk while tracking reference
- 19 servo bursts in a substantially spiral trajectory.